

DOCKET FILE COPY ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

RECEIVED

AUG 15 1994

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
Implementation of Section 17 of the)
Cable Television Consumer Protection and) ET Docket No. 93-7
Competition Act of 1992)
)
Compatibility Between Cable Systems)
and Consumer Electronic Equipment)

**PROPOSAL OF THE CONSUMER ELECTRONICS GROUP
OF THE ELECTRONIC INDUSTRIES ASSOCIATION
FOR A DECODER INTERFACE STANDARD**

The Consumer Electronics Group of the Electronic Industries Association ("EIA/CEG") hereby proposes that the Commission adopt the standard set forth herein for the Decoder Interface contemplated by the Commission's Report and Order ("Order").¹ EIA/CEG's proposed standard for the Decoder Interface incorporates the standard which is being filed today by the Cable-Consumer Electronics Compatibility Advisory Group ("C3AG"). As set forth herein, that standard should be supplemented with a specification for a flexible and future-oriented "command set."² As supplemented, the Decoder Interface Standard, Draft IS-105, responds to the requirements of the Commission's Order and should be promptly adopted.

¹ 9 FCC Rcd 1981 (1994).

² The "command set" is the agreed upon series of commands that allow receivers to interact with the decoder module.

No. of Copies rec'd
List ABCDE

0210

I. THE DECODER INTERFACE STANDARD PROPOSED BY THE C3AG IS SOUND AND SHOULD BE PROMPTLY ADOPTED BY THE COMMISSION.

EIA/CEG is pleased that the Joint Engineering Committee ("JEC") and the C3AG have been able to achieve so much in formulating a standard for the Decoder Interface. With the exception of the command set, EIA/CEG and the National Cable Television Association ("NCTA"), working through the JEC and C3AG, have developed a standard that meets the requirements of the Commission's Order. Of paramount importance, the proposed standard allows the separation of security functions from other, competitively-supplied functions. Although the exact meaning of this separation has been the subject of vigorous debate, the proposed standard implements the separation of functions which the Commission seeks.

EIA/CEG wishes to emphasize the significance of the agreement -- by parties with very diverse interests -- which the standard represents. The Commission should be sensitive to the carefully crafted balance which the standard reflects and respectful of the diligent work of engineers from both industries. Accordingly, the Commission should adopt, without change, the Decoder Interface Standard proposed by C3AG.

II. THE COMMISSION SHOULD ADOPT EIA/CEG'S SPECIFICATION OF A FLEXIBLE AND FUTURE-ORIENTED COMMAND SET.

As noted above, the Decoder Interface Standard proposed by C3AG needs to be supplemented in a number of respects. The remaining specification as to which the cable and consumer electronics industries are in disagreement is the scope of the commands that can be transmitted between receivers and set-back modules. Among other things, the commands allow

consumers to use the features contained in set-back modules. These features can be controlled by messages sent from the receiver, through the Decoder Interface, to the set-back module.

EIA/CEG has proposed a command set that is rich in functions, flexible in application, and adaptable for future uses. For its part, NCTA has found the command set proposed by EIA/CEG to be acceptable. In addition to the command set, however, NCTA wants the Decoder Interface -- that is, a television receiver -- to "pass through" all infrared ("IR") codes that it receives -- whether or not they are recognized by the receiver -- to the set-back module. As EIA/CEG has repeatedly explained to NCTA, the consumer electronics industry cannot agree to this request, which is technically infeasible and totally inconsistent with the Commission's goals in this proceeding.

Before delving into the specifics of the disputed IR codes, it is important that the Commission understand the history of cable-consumer electronics compatibility efforts. Several years ago, EIA/CEG and NCTA developed the MultiPort interface (EIA-563) to permit the use of set-back decoders rather than set-top cable boxes. Consumer electronics manufacturers produced over a million receivers with the MultiPort interface, yet the standard died largely because cable operators were reluctant to use the interface. As one of them explained, "[i]t's almost like we failed to support our own good idea."³

When discussion of the Decoder Interface began, the cable industry wanted to resuscitate an enhanced MultiPort interface. That interface, however, is only capable of carrying baseband signals. Moreover, rigid command signals can only be transmitted in one direction

³ "MultiPort - Cable Gave a Party and Didn't Come," Multichannel News, June 17, 1991, at 50.

through the interface. EIA/CEG proposed a more flexible command set. EIA/CEG's goal is to establish a Decoder Interface Standard that would permit two-way communication through the interface, permit the use of menus generated by set-back modules, and otherwise support the use of functions located outside of the television receiver. A standard embodying a command set that meets these requirements (and that supplements Section 5.5.4 of the Decoder Interface Standard proposed by C3AG) is set forth in the attachment to this pleading. EIA/CEG asks that it be promptly adopted by the Commission.

A. EIA/CEG's Proposed Command Set Is Flexible, Unlimited, and Future-Oriented.

The command set developed by EIA/CEG is extremely flexible. It is also capable of operating any conceivable functionality that might be provided by a set-back module. The 40 commands in the command set, which can be used to direct the operation of a set-back module, include the following commands:

- 10 Digits (0-9) (to change channels or operate menus)
- Enter (to select item)
- Buy (for home shopping applications and other transactions)
- Cancel
- Up, Down, Left, Right (for guiding through menu options)
- Channel Up/Down
- Menu/Menu Cancel (to summon/end menu options)
- Mode (to change among set-back modules or functions)
- 10 Module Defined Functions (that can be custom tailored)

As the above descriptions should make clear, these commands are open-ended and can support any conceivable feature that a set-back module might provide.

The robust and flexible nature of these commands becomes readily apparent when one compares them to the features of user-friendly personal computer programs that are now widely available in the marketplace. As sophisticated as such programs as WordPerfect and

Windows are, they use just a handful of rudimentary commands when operated by a mouse. Indeed, most computer programs use only a few fundamental commands, such as navigation and function keys, for easy operation. Even less user friendly programs employ a limited number of "function" keys and, they are capable of supporting an endless variety of menus. The command set proposed by EIA/CEG provides consumers with the same easy access to the functions provided by set-back boxes.

At one point, NCTA proposed a closed set of highly specific commands. Although these commands were likely to be useful today, they were unlikely to adapt well to the future. By contrast, EIA/CEG's proposed command set is open and can easily be adapted to support future functions and features. Indeed, the command set and architecture of the Decoder Interface should provide cable operators, video dialtone providers and direct broadcast satellite operators with the ability they need to offer any features they choose. EIA/CEG's proposed standard contains three levels of "future-proofing." First, the menu system can be expanded and layered to provide an unlimited array of functions for any future feature. Second, the ten module defined functions can be repeatedly redefined by each feature module so that they can be reused without limit. Third, because the command set operates on a bus architecture, additional of set-back modules can be supported allowing a multitude of additional future features.

Because it is so flexible, EIA/CEG's proposed command set is for all practical purposes "future-proof."⁴ Moreover, because it is concise, it is user friendly and easy to use.

⁴ Significantly, Starsight, a leading provider of innovative on-screen display functionality, has reviewed EIA/CEG's proposed command set and indicated that it finds the command set to be sufficiently flexible.

The Commission should, therefore, incorporate EIA/CEG's command set in the Decoder Interface Standard proposed by C3AG.

B. The IR Code "Pass Through" Requested by NCTA Is Not Technically Feasible.

In addition to the flexible command set proposed by EIA/CEG, NCTA wants the Decoder Interface Standard to include a requirement that television receivers "pass through" all IR codes to the set-back module. The stated reason for this pass through requirement is the cable operators' fear that the command set might not support a function provided by their set-back modules. The necessary consequence of this would be that cable operators would provide their own remotes rather than rely on the Decoder Interface command set. Despite repeated requests, NCTA has been unable to identify any functions or features that cannot be supported by EIA/CEG's proposed command set. The requested pass through feature is therefore totally unnecessary.⁵ It is also technically infeasible.

The IR receivers in television sets are programmed to recognize certain IR frequencies and to filter out all other frequencies. When an IR receiver is presented with other, unrecognized IR frequencies, the receiver treats the transmission as "noise" and filters (i.e., ignores) the signals. If these filters were eliminated, the receiver would be constantly called

⁵ Moreover, because IR code pass through would necessitate the creation of additional interfaces (beyond the command set in the Decoder Interface Standard), it would needlessly increase consumer confusion without improving compatibility.

upon to analyze and do something with every stray IR signal.⁶ This is not technically feasible. As a consequence, any standard that required television receivers to pass through all unrecognized IR frequencies would simply not be workable.

Nor would the problem be solved by requiring television receivers to pass through all transmissions using recognized frequencies, but unrecognized codes. Placing all of this data on one bus leads to potential misoperation if codes that are only slightly different from recognized codes cause receivers to mistakenly respond.⁷ Many consumer electronics manufacturers produce an array of electronic equipment that employ a family of related IR codes and commands. Many of these manufacturers have already assigned all of their codes for various functions in their many products, which are marketed worldwide. Thus, a code that is unused by a television receiver may be used by another such as a stereo, VCR or other device. Similarly, two set-back modules might coincidentally use the same unassigned codes. A code intended for one might cause an unintended and unexpected result in another. To the extent that any organized system for transmitting codes (that does not conform to the command set) to set-back modules is attempted, a passed through signal intended for one module might affect another module. Such attempts will inevitably lead to increased consumer confusion.

⁶ The consumer electronics industry has had problems recently with the increased usage of compact fluorescent lightbulbs. These increasingly popular lightbulbs emit frequency transmissions that can interfere with IR equipment. Stray and unrecognized transmissions, such as those proposed by NCTA, are already a problem for consumer electronics equipment. More stray signals should not be encouraged.

⁷ For example, receivers attempting to act on unrecognized IR codes could abruptly change channels, change volume, or even turn off. Such unexpected and unexplainable occurrences would lead consumers to conclude that something is wrong when, in fact, the problem lies with unrecognizable and unexpected IR codes.

Even if unrecognized codes could be "pipelined" to the Decoder Interface, these unstructured non-standardized message cannot coexist with the well-behaved messages that are generated by each feature box using its own programmed intelligence. This intelligence follows well-known local area network models. The Decoder Interface message protocol is defined by EIA IS-60. IS-60 is a home automation standard developed over a period of eight years and designed to support the present and future needs of a wide spectrum of consumer products. The "rules of the road" for the Decoder Interface are detailed and specific. For example, when a box needs to send a message, it must listen before sending, so that its message does not collide with other messages on the bus. Since the IR pipelined messages are not required to follow such rules, destruction of both messages results.

There are other requirements for the Decoder Interface, such as addressing and fair access, which are not supported by this chaotic approach. The JEC selected a bus structure to allow multiple units to share information and to facilitate new services in a competitive environment. IR code pass through represents an incompatible intrusion into this process. The Commission should therefore decline NCTA's proposal to include IR code pass through as part of the Decoder Interface Standard.

C. The IR Code "Pass Through" Requested by NCTA Would Defeat the Compatibility Goals of the Cable Act and This Proceeding by Allowing Cable Operators to Force a Second Remote Control on Subscribers.

In addition to being unnecessary and technically infeasible, NCTA's requested IR code pass through constitutes bad public policy. If IR code pass through became part of the Decoder Interface Standard, cable operators would have an economic incentive to utilize set-back modules that could only be operated using passed through IR codes, rather than the command

set of the Decoder Interface. In other words, consumers would once again be compelled to use cable-provided remote controls to operate their cable service.⁸ As Yogi Berra once said, "this is déjà vu all over again." To create an environment in which consumers are burdened with the obligation to acquire a second remote control would make a mockery of the Cable Act. It would also defeat the purpose of the Decoder Interface, i.e., to increase compatibility between cable systems and consumer electronics equipment.⁹

The Commission should not be misled by NCTA's IR code pass through proposal. It appears to be nothing more than an attempt to insure a place for cable-provided rental remote controls in the future. Congress has already objected to such a result. So, too, should the Commission.

III. THE COMMISSION SHOULD PROMPTLY INITIATE A RULEMAKING PROCEEDING TO ADOPT DIGITAL STANDARDS.

As the Commission's Order recognizes, the Decoder Interface Standard is a major step towards achieving cable-consumer electronics compatibility today. In order for consumer electronics equipment to be compatible with the cable signals of tomorrow, however, the Commission must prescribe digital transmission standards. If the Commission fails to act promptly, the deployment of digital cable systems -- which will soon be underway -- will create

⁸ The history of the cable industry in forcing monopoly-supplied remote controls on subscribers speaks for itself. This practice was one of the many reasons why the Cable Act was passed. The Commission should not give the cable industry another opportunity to impose unwanted remote controls on subscribers.

⁹ Given the statements of the cable parties in the reconsideration phase of this proceeding about the proprietary nature of IR codes, it is doubtful that cable operators would permit the use of universal remotes to operate their set-back modules.

an environment in which set-top boxes may be required even with cable-ready receivers. Clearly, this is not what the Commission intended when it began this proceeding.

In January 1994, C3AG urged the Commission to adopt digital standards. The Commission recognized the importance of these standards in its May 4 Order. At that time, it indicated that a proceeding on digital standards would soon be initiated.¹⁰ Given the announced deployment of digital technology by several major cable operators, the need for the Commission to initiate such a proceeding has become more pressing. EIA/CEG therefore urges the Commission to begin that proceeding as soon as possible.

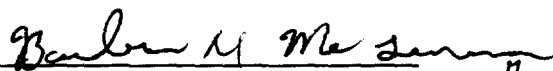
¹⁰ 9 FCC Rcd at 1987.

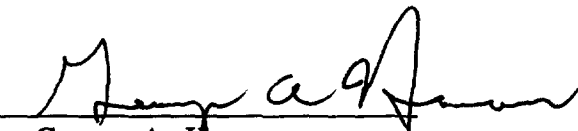
IV. CONCLUSION

For all of the reasons set forth above, EIA/CEG respectfully requests that the Commission adopt the Decoder Interface Standard proposed by the C3AG, as supplemented by EIA/CEG's flexible command set. In addition, EIA/CEG urges the Commission to initiate a proceeding on digital standards as soon as possible.

Respectfully submitted,

CONSUMER ELECTRONICS GROUP
ELECTRONIC INDUSTRIES ASSOCIATION

By: 
Barbara N. McLennan
Staff Vice President
Government and Legal Affairs

By: 
George A. Hanover
Staff Vice President
Engineering

2001 Pennsylvania Avenue, N.W.
Washington, D.C. 20006
(202) 457-4900

Of Counsel:

Joseph P. Markoski
Jeffrey A. Campbell
Squire, Sanders & Dempsey
1201 Pennsylvania Avenue, N.W.
Post Office Box 407
Washington, D.C. 20044
(202) 626-6600

August 15, 1994

Control Line Command Specification

August 11, 1994

**Prepared by the Consumer Electronics Caucus
of the
Cable-Consumer Electronics Compatibility Advisory Group**

Control Line Command Specification EIA/CEG

Scope

This recommendation specifies a set of messages (commands) that may be transmitted on the Decoder Interface Control Line. The scope extends to the messages only. Communications protocol, electrical, and mechanical requirements are found in (Draft) IS-105 for the Control Line, baseband video/audio, and IF/AGC.

Introduction

A brief description of the intent and interaction of receiver and decoder is given here.

The decoder interface is designed to allow consumer electronic devices to be connected to various external devices (e.g., decoders) via the decoder interface multi-pin connector. Typical consumer electronics application of the interface would be in televisions and VCRs (receivers), each of which have features that may interact with these decoders.

All of the signals on this connector are designed to be "bused", that is, extended to multiple devices which share the signals provided by the decoder interface. This architecture allows all devices sharing an interface to interact with each other and share data in the form of audio, video and control. In addition, the control line allows the audio and video buses to be shared by multiple sources of data.

Decoders may provide access control and/or sources of video and audio from service providers. In addition, decoders may provide other features that are intended to be integrated with the capabilities of the CE device.

A goal of this standard is to allow receivers and decoders to provide their full functionality without restricting features and functions of other attached devices. This requirement demands a high level of interactivity between devices on this interface.

Both the access control and features provided by a decoder are activated by a receiver sending a channel change message to the decoder. Decoders, such as cable TV descramblers, would have no need to interact with an attached receiver if the currently selected channel were "in the clear." If a scrambled channel were selected by the user, then a descrambler may at that point provide descrambled video to the receiver with no additional action needed by the user. Decoders that do not provide broadband video and/or audio to a receiver may be explicitly activated via the user interface of the receiver. That activated device is then allowed to interact with the receiver. Ultimately the user is in control of the system.

(Draft) IS-105 fully specifies an interconnection method for receivers and decoders through a

Control Line Command Specification EIA/CEG

Decoder Interface. The Decoder Interface is comprised of an IF output from the receiver to the decoder with AGC multiplexed on the same coaxial cable and a separate twisted pair cable. The twisted pair cable, called the Multi-pin Connection, includes video and audio baseband return paths and the Control Line that is the data path for all control and status messages. All signals are bused to support multiple decoders connected to a single receiver. The IF output is limited to two loads (decoders that use IF as an input).

In (Draft) IS-105, the Control Line is specified electrically, in its channel access protocol, and in its message format. This specification covers the remaining detail, the message content.

Types of Messages

Messages on the Control Line are placed in two categories. User Commands are those commands initiated by the user through interaction with the receiver that are in turn transmitted to the Decoder for processing. Control Commands are the remainder of commands that receivers and decoders exchange in the course of coordinating shared resources of the Decoder Interface. For example, a command from a decoder to the TV to request a channel change is a Control Command.

Message Encoding

All messages shall be encoded using the Common Application Language of EIA IS-60 and AV-related Contexts of (Draft) IS-133. Syntax for the encoding is found in IS-60. Codes specific to Audio/Video consumer electronics are found in (Draft) IS-133.

User Commands

User Commands are generated by input from the user through the user interface provided by the manufacturer of the receiver. The receiver normally accepts and processes user input without echoing the input to the decoder. A decoder may request that the receiver report User Commands so that the decoder may interact with the user. In this state, User Commands are transmitted to the decoder according to Table 1.

The command name is given in the first column, and the Control Line transmitted value is given in the second. The third column indicates examples of typical usage. However, this standard places no constraint on the interpretation of the User Command by the decoder. For example, digits may be interpreted as shown in the table or may actually be a phone number, date of birth, or other numeric data. There is a logical limit to the flexible interpretation of User Commands. When a user enters a digit through the receiver, the user expects the decoder to receive the digit. Decoders should interpret User Commands in accordance with the expectation of the user.

Control Line Command Specification
EIA/CEG

Table 1
User Command Definition

Command	Transmit Value	Usage
Digits 0-9	0-9	Digit entry for PIN, menu item selection, other data entry
Enter	10	To complete an entry or select an item
Buy	11	Purchase an offering presented by the decoder
PIN delimiter	12	Separate Personal Identification Number
Cancel	13	Cancel an activity
Up	14	Up navigation command
Down	15	
Left	16	
Right	17	
Channel Up	18	Channel change for decoder
Channel Down	19	
Menu	20	Call up a menu for further user interaction
Menu Cancel	21	Cancel (escape from) the active menu
Mode	22	Change active receiver or decoder module
F1-F10	23-32	Function keys with flexible interpretation by the decoder

Control Commands

Control Commands are necessary to support the complete operation of the Decoder Interface. Table 2 lists Control Commands. Transmitted values are not given, as these commands are required to be encoded in the industry standard format of IS-60 and (Draft) IS-133.

**Control Line Command Specification
EIA/CEG**

**Table 2
Control Command Definition**

Command	Usage
Decoder as Audio Source	Notify receiver to use baseband audio as the source
Decoder as Video Source	Notify receiver to use baseband video as the source
Request Channel Change	Request receiver to tune another channel (by IS-132 number)
Y/C Present	Separate luminance & chrominance signals are available
VCR Record Mode	Start recording of the signal returned by the decoder
EBS Status	Notify the receiver that emergency broadcast is active
Decoder OSD Status.	Allows Decoder to indicate that its OSD is active so that the receiver may clear the internal OSD.